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AMBLYPODA ; (*Taligrada*) ; Pantolambdidæ ; (*Pantodonta*) ; Coryphodontidæ ; (*Dinocerata*) ; Uintatheriidæ.

DIPLARTHRA ; (*Perissodactyla*) ; Lophiodontidæ, Triplopidae, Cænopidæ, Hyracodontidæ, Rhinoceriðæ, Tapiridæ, Lambdotheriidæ, Menodontidæ, Palæotheriidæ, Equidæ ; (*Artiodactyla*) ; Pantolestidæ, Eurytheriidæ, Anoplotheriidæ, Dichobuniidæ, Cænotheriidæ, Anthracotheriidæ, Xiphodontidæ, Suidæ, Hippopotamidæ, Merycopotamidæ, Dichodontidæ, Oreodontidæ, Poebrotheriidæ, Protolabididæ, Camelidæ, Eschatiidæ, Tragulidæ, Moschidæ, Bovidæ, Cervidæ.

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## NOTES ON THE ARCHEOLOGY AND ETHNOLOGY OF EASTER ISLAND.

BY WALTER HOUGH.

EASTER Island forms the southwesterly extremity of the Polynesian Archipelago, in S. lat. 27°, W. long. 109°, about 1900 miles west of Santiago, Chili. It is roughly twelve miles long by four wide, volcanic in origin. It is inhabited now by a remnant of Malayo-Polynesian stock.

From an archeological point of view, this island is very interesting ; stone images, carved stones, subterranean dwellings, weapons, tools, cave ossuaries, etc., abound. One of the last acts of the late Professor Spencer F. Baird was to induce the Navy Department to send a vessel to explore the island, and bring back representative specimens. The U. S. S. Mohican, then at Tahiti, was detailed, and the fruits of the successful twelve days' exploration are to be seen in the North and West halls of the National Museum, consisting of several stone images, carved stones, painted slabs, and the fine collection of smaller objects procured by Paymaster W. J. Thomson, U. S. N.

The museum is indebted to the latter gentleman, and to Surgeon Geo. H. Cooke, U. S. N., for information concerning the specimens and the people of the island.

The largest figure collected is a torso and head (Fig. 1) weighing three tons, and standing over eight feet high, made of a porous volcanic rock, probably friable basalt lava, or tufa. The

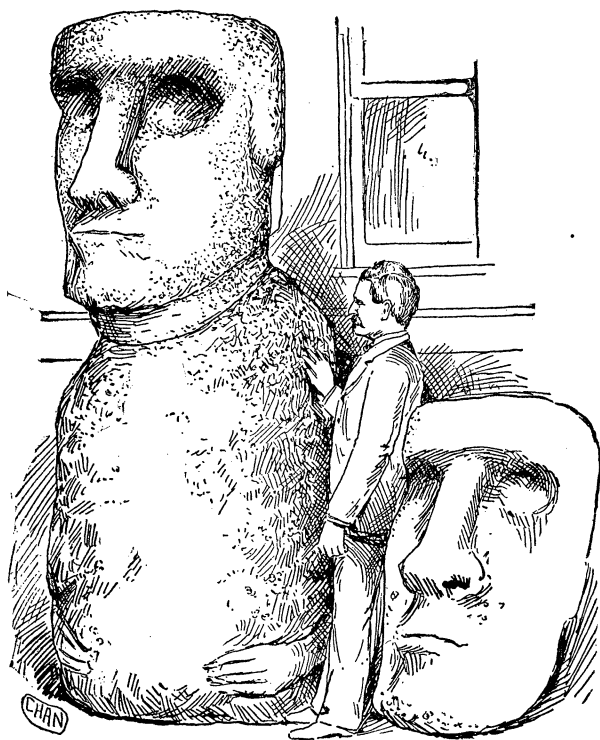


FIG. 1.—EASTER ISLAND IMAGES IN NATIONAL MUSEUM.

face is very broad, with crude features. Large eye-sockets are cut out for the reception of pieces of obsidian representing eyes. The arms clasped over the breast are only outlined; all the statues have only the face modeled, that part being worked out with the highest skill possessed by the artists. In detail, this is shown by the nose. The septum is wide, as in the Papuan nose, and the

alæ are prominent. The lips protrude with a pouting expression. The oval eye-sockets measure 13 by 8 inches. The ears are 21 inches long, not modeled except in general outline, and having a few shallow grooves. The edges of the lower jaw are sharp, and the neck is cut squarely into the breast. A necklace is apparently marked out. The pectoral mammæ are obscurely shown. The back of the figure is nearly flat, and parallel verti-

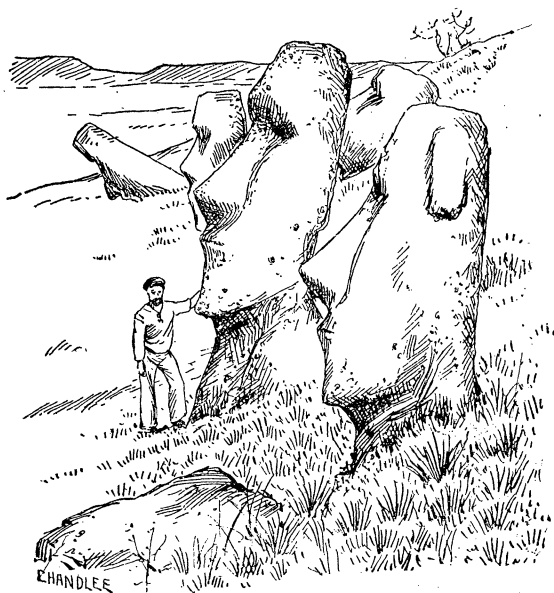


FIG. 2.—IMAGES PARTIALLY BURIED IN THE DEBRIS IN CRATER OF RANAKAU.

cal grooves show how the image was chopped out. The stone is wreathed and covered with lichen, so that there are scarcely any traces of tool marks. Certain rounded blocks of very vesicular rock are crowns that were placed upon the flat heads of the figures. Characters are seen carved on the side of the crown.

Originally from six to fifteen colossi were set upon long but narrow platforms or terraces of stone. There are various conjectures as to their meaning. Mr. Thomson thinks they were merely

commemorative, and that the platforms were burial places of the chiefs. Nearly all the six hundred figures on the island are prostrate, it is not known through what agency. The platforms are 113 in number, and the largest found was 150 feet long, 9 feet high, and 6 feet wide. With the original wings, it would

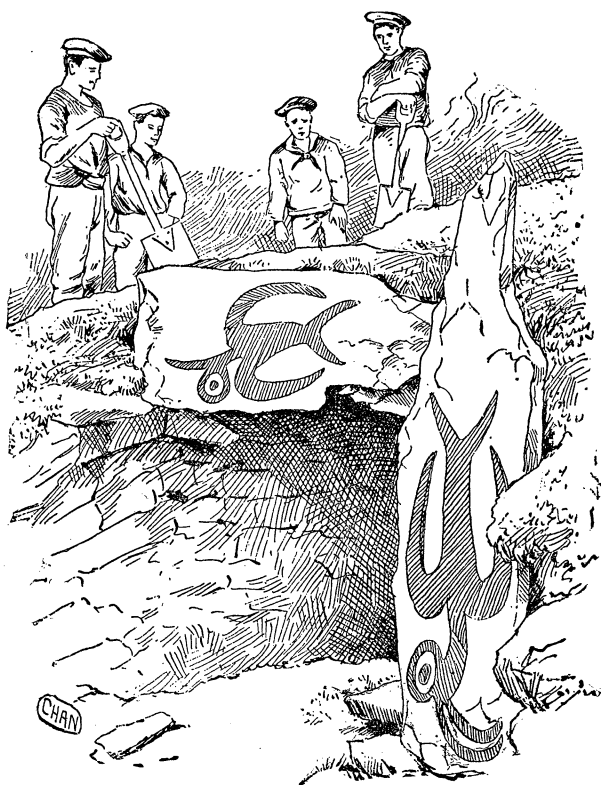


FIG. 3.—MOHICAN PARTY UNCOVERING A HOUSE.  
(Slabs in the National Museum.)

have been 340 feet long. The images are of various sizes, the largest 70 feet in height.

The workshop and quarry where the workmen got these figures out was in the crater of the extinct volcano of Ranakau, now partially filled with a marsh, and showing in places the cavernous cliff of its ancient rim. There are dozens of images yet in the

crater. (Fig. 2.) No metal was known ; the tools were chisels and adze blades of tough volcanic rock. They cut into the cliff, outlining and rounding the figure until it was detached, then probably mounted it on skids, and dragged it to its destination.

Though the volcano is 1400 feet in height above sea-level, the crater is easily accessible over a low, sloping place in its rim. How these people moved these images over the singularly difficult topography the island presents, is a problem. They moved monoliths 60 feet high, weighing at least 50 tons, twelve miles, and set them up! This, too, without any timber, except driftwood. Many of the images were abandoned, however ; they are strewn all the way from the crater—the only place where suitable rock was found—to the platforms.

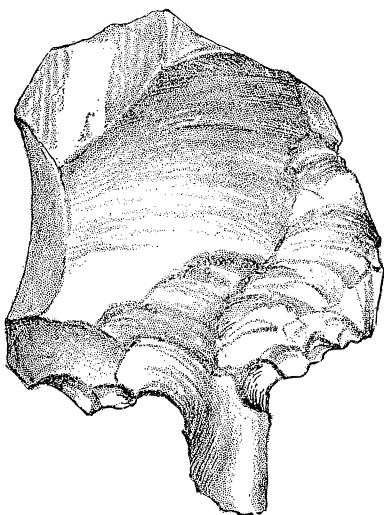


FIG. 4.—SPEAR HEAD OF OBSIDIAN.



FIG. 5.—SPEAR HEAD OR BATTLE AXE MADE OF OBSIDIAN.  
(From specimens in the United States National Museum.)

The houses found on the island were arranged in parallel rows facing the sea, built of small irregular slabs of stone. They  
Am. Nat.—October.—3.

have one room, usually measuring fourteen feet long by six in width, and five feet two inches high, with walls in some cases five feet thick. They are lined and roofed with pictured slabs (Fig. 3), and a mound of earth was heaped over the top. The doorways are on a level with the ground, and are so narrow that it is difficult to squeeze into the chamber. One of these slabs, weighing about six hundred pounds, brought in the Mohican, has the picture of a bird, or marine animal with a bird's head, in red and white, with outstretched wings, upon it. In these subterranean houses Mr. Thomson found many peculiarly-shaped obsidian spear heads. They resemble, somewhat, ancient battle axes, and are supposed to have been used as missiles, and, hafted on poles, as spears. There are several distinct forms (Figs. 4 and 5). Stone fish hooks, adze blades, round stones, are found also on the surface and in the houses.

Mr. Thomson procured two slabs of wood, one  $9\frac{1}{2}$  inches by  $3\frac{1}{2}$ , the other 24 inches by  $4\frac{1}{2}$  inches, covered with rows of hieroglyphics. The somewhat remarkable fact that these people wrote has been known for years. These tablets were said to have been numerous on the island some years ago, but were destroyed through the zeal of Catholic missionaries. There are now but some seven or eight in existence, held by the Bishop of Tahiti, the British and the U. S. National Museums. The Bishop of Tahiti observed the natives consulting these tablets, and obtained, as he thought, a translation of them. It has been found that the islanders were using them merely as a mnemotechnic device to aid them in running back the genealogy of their chiefs, and did not follow the characters in the obvious way that they were written. The characters are about half an inch in height, beautifully carved, it is supposed with shark's teeth. They carry their meaning in the thing they represent, and are followed by beginning at the left hand lower corner on the particular side of the tablet that will bring the characters erect. Finishing the lower line with the figures turned toward the reading, and going to the next line above, the reading is continued from right to left (boustrophodon). In order to have the images face the same

way, it is necessary, in reading a new line, to turn successively the right side of the tablet to the left.

The native traditions state that their ancestors came from Rapaiti ( $27^{\circ} 35' \text{ S. lat.}, 144^{\circ} 20' \text{ W. long.}$ ) under Chief Tocuyo, and that twenty-two chiefs have succeeded him up to twenty years ago (about 500 years).<sup>1</sup> They say that Tocuyo knew the language of these tablets, and brought with him sixty-seven tablets containing allegories, proverbs, and traditions of the country from

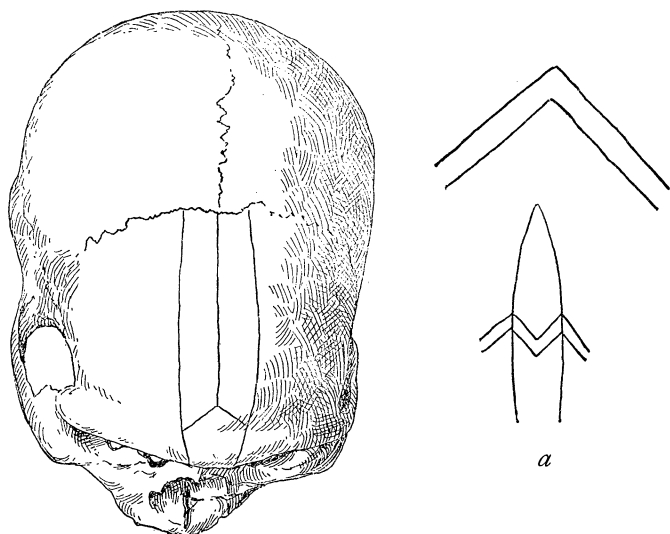


FIG. 6.—SKULL WITH SIGN ENGRAVED ON FRONTAL BONE, (a) DESIGNS FROM OTHER SKULLS.

(From specimens in the United States National Museum.)

which they came. A certain number of youths from each clan were instructed in the reading of these writings, and on a great fête day, once a year, the people assembled to hear them read. Some characters like those on the tablets appear on the platforms and the doorposts of the ancient stone houses. Three skulls (Fig. 6) in the Thomson collection have each a character deeply cut in the frontal bone. These skulls were said by the natives to have been of their chiefs.

<sup>1</sup> Palmer, Visit to Easter Id. *J. Roy. Geog. Soc.*, XL., 1870.



Hieroglyphs like those of the tablets also appear on the doorposts, slabs, and in other places. Near the platforms and houses are many curiously-carved stones, sometimes on rock masses and again detached grotesque carvings. Fig. 7 represents one of the latter.

THE NATIVES.—The natives number at present about 155; it is supposed that on the discovery of the island by Roggween in 1722 there were 20,000. Having lived so long in isolation, they were peculiarly ill-adapted to stand the pressure of a higher civilization. Their history for the past 150 years has been one

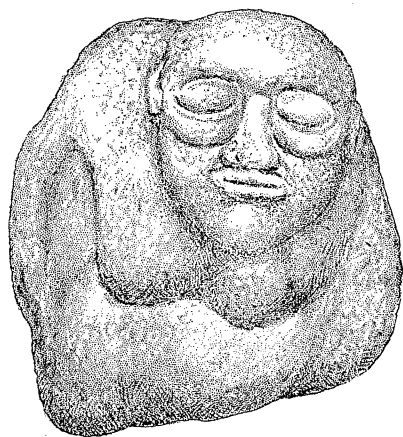


FIG. 7.—GROTESQUE CARVING IN STONE, EASTER ISLAND.

(From specimens in U. S. National Museum.)

of constant wars: some have said that missionaries were the cause, and that during these strifes the monuments were thrown down. Chili impressed several ship-loads of natives as coolies some years ago. The remnant are pure Polynesians; their language, arts, and religion are those common to that stock. They make tapa, or mulberry bark cloth, for clothing, and plaited mats of bulrushes to sleep upon. In Mr. Thomson's collection there are several crownless

hats made of the feathers of fowls. There are six different styles. The hat worn by the dancing women is small and narrow, with feathers of bright color overlapping all the way around. The married women's hat, worn upon the ceremony connected with a betrothal, is broad, made of black feathers about six inches long, clipped evenly all the way around. The men at their food feasts wore a small hat of feathers, with long tail feathers hanging behind. The hat of the chief, worn as an insignia of office, is large and heavy, clipped evenly, the back ornamented with the largest and finest feathers to be had. The minor officials and chiefs (*ex officio*) wear a lighter hat, made

of short black feathers, with four tail feathers on end, and tending outward at regular intervals. The head-dresses are highly regarded.

There seems always to have been a scarcity of timber; this accounts for the houses differing from the Polynesian dwelling in being made of stone.

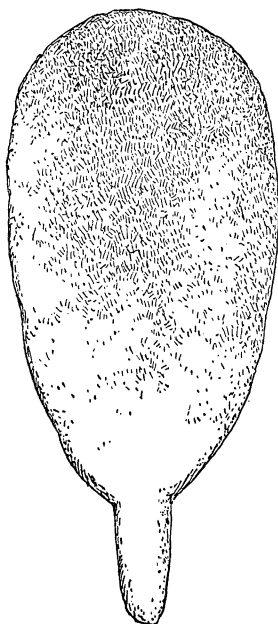


FIG. 8.—CONJURING PADDLE MADE OF BONE OF WHALE.

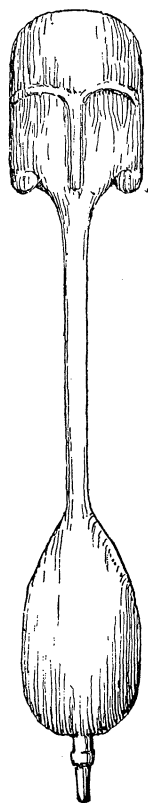


FIG. 9.—POTATO FETISH OF WOOD CARVED AND PAINTED IN RED.

(Both from specimens in the United States National Museum.)

They lived principally on fish, though the yam, taro, bread-fruit, banana, and other food supplies were drawn upon. Hooks were made of bone; nets were made of hemp. The bonito, a mackerel, was the principal fish caught.

Weapons were clubs and spears ; it is presumed that the bow and arrow were not in use. Mr. Thomson says that hemp nets were used in fighting.

Conjuring wands were used by the natives. One, a broad paddle of bone of the whale, 30 inches long (Fig. 8), is supposed to possess power to work a charm on an enemy. The shaman working the spell performs a convulsive dance, making mysterious movements with the wand, and muttering incantations. Such charms are believed to bring speedy death upon their victim. A special potato paddle, called *raha*, was stuck in the ground to protect the potato crop from drought, insects, and evil spirits (Fig. 9). These paddles are of wood, painted red, and with a blade on each end. Ceremonial paddles of the same shape as the latter, but larger, with one blade grotesquely painted, were used, as were long clubs with a double head carved on one end, by chiefs when addressing assemblies.

Rude, unshapen stones were distinguished by the natives as gods of three varieties. These are the fish god in general, called *Mea Ika* ; the bonito's god, called *Mea Kahi* ; and the fowl god, called *Mea Moa*. The gods were never common, and were possessed by clans or communities, and never by individuals. They were moved about from place to place as they were needed. An especial god being set apart for the bonitos is attributed to the fact that that fish has always been abundant and highly prized as food.

Who were the people whose remains have been noticed ?

This question is asked because there are several theories that rule out the ancestors of the present occupants of the island as authors of the works. It has been argued that they were not :

1st. Because the Polynesian, as we know him, is averse to sustained labor. This argument would perhaps apply at present, but it is evident from all accounts that all groups of the island race were energetic in building houses, canoes, in seafaring, and in many places (a list is given in Waitz's *Anthropologie*, Vol. V.) made stone edifices and sculptures of great extent. There is a pyramid in Tahiti 260 feet long, 90 broad and 40 high, made of squared stone.

2d. Because the present Easter Islanders do not know about the ruins, but say, "The gods made them." This failure or incompleteness of record is a matter of common observation.

3d. The strange facies of the remains. While some local modifications exist in the island, these monuments were no doubt built under the same impulses that prompted the erection of megalithic structures everywhere.

4th. The fact that writing was known. The discovery of the engraved slabs brings out an unique phase of progress not known elsewhere in the units that go to make up the Polynesian race. Until the tablets are read there is doubt as to the character of the record, whether they are lists of chiefs or a sequence of ideas in written language. There seems to be a pretty clear tradition as to the introduction of the tablets, and those that I have seen, from their state of preservation do not appear to be very ancient. However, it would seem but a small step from the plaiting of hieroglyphic tabu signs, spoken of by Turner among the Samoans (Samoa, p. 185), to the delineation of them on surfaces, and this step may have been taken in this case.

In the dry caves of the island are skulls of the supposed former inhabitants, that might, if craniometry were of any value in race classification, throw some light on the inquiry.

A people who have been thought possibly to have been the builders of the Easter Island remains, are the Papuans. It is said that they are more energetic than the Polynesians, and are hence more likely to have undertaken the difficult works. The art has also been thought to have a Papuan appearance.

Conclusions of this kind are very unstable, because based on an uncertain premise. It is probable that a judicial review would show the facts equally pointing to the agency of the ancestors of the miserable remnant of Easter Islanders in the works. The presumption should always be in favor of an existing tribe against unknown peoples; but it is one of the sins of ethnologists that they have "gone after strange gods," and dealt too much in mere speculation. The language of the Easter Islanders should be closely examined for words derived from other sources; language

shows admixture more convincingly than arts, but not more in reality to those who are in a position to make comparisons.

The remark of Prof. O. S. Mason is a reliable statement of the question for the present, that "the Easter Island images are the most interesting of the archeological enigmas." Mr. Thomson is preparing a monograph on Easter Island for a forthcoming Smithsonian Report, from the material gathered on the Mohican survey and from other sources, which will allow a judgment to be passed on these questions, and which will give all that is known about the archeology and ethnology of this interesting field.

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#### ARE THE GERMAN SCHWEINE-SEUCHE AND THE "SWINE PLAGUE" OF THE GOVERNMENT OF THE UNITED STATES IDENTI- CAL DISEASES?

ONE of the most valuable and interesting contributions to the literature of the German Schweine-seuche is that of Bleisch and Fiedeler.<sup>1</sup>

The investigations of these observers appear to have been most carefully made, and every necessary precaution used. They extended over fifty-two swine, in an outbreak in which sixty of sixty-three died. According to their statement, the same micro-organism to which the name "Loeffler-Schütz" has been given, was found in every case, of which they say: "While the dispersion of the bacteria in the organs and blood of the inoculated rabbits and hens is in general about equal, these investigations show that in swine they are most numerous in the mucus filling the bronchial tubes which lead to the diseased portions of the lungs, and less numerous in the caseous parts, while equally scarce or wanting in the gray-red hepatized portions as well as in the spleen and liver.

<sup>1</sup> "Beitrag zur Kenntniss der Schweine-seuche." *Zeitschrift für Hygiene* (Koch's), Vol. 5, p. 400, and *Archiv für wiss. und prac. Thierheilkunde*, Vol. 5, 1889.